

ncagr.com/agronomi/pdf/samnemas.pdf as well as on the back side of nematode sample information forms.

- **Use the appropriate sample container and sample information form.** Get nematode assay boxes, plastic bags and sample information forms from the NCDA&CS Agronomic Division office in Raleigh, regional agronomists or county Cooperative Extension offices. Fill out sample form AD-3 for routine nematode samples and AD-5 for problem samples. Both are available at www.ncagr.com/agronomi/uyrnem.htm.
- **Include payment for fee or reference the appropriate escrow account.** For a complete list of the fees for specific agronomic tests, visit www.ncagr.com/agronomi/fees.htm.
- **Ship samples quickly and correctly.** The best way to submit samples is to send them via private carrier (UPS, FedEx, DHS) to the Nematode Assay Section's physical address. Samples sent through the postal service go through the Mail Service Center and take longer to arrive.

Management Options

Take steps to manage nematodes before planting. If you have results from a nematode assay, you will know whether you should choose an alternate crop, look for a resistant variety, plan to rotate crops and fields and/or apply a nematicide. After a crop is in the field, management options are limited.

Having a current nematode assay report can help you plan ahead and select management

strategies that are best suited to your particular situation. Effective approaches often include a combination of biological, cultural, chemical and mechanical control measures. Contact an NCDA&CS regional agronomist or a Cooperative Extension agent for site-specific recommendations.

There are no chemical nematicides registered for home use. The best way to control nematodes in small gardens is to plant nonhosts or resistant varieties and to use good site-preparation techniques. Some types of marigolds can also have a negative effect on plant-parasitic nematodes. For more information, visit www.ncagr.com/agronomi/uyrnem.htm.

For additional information, contact

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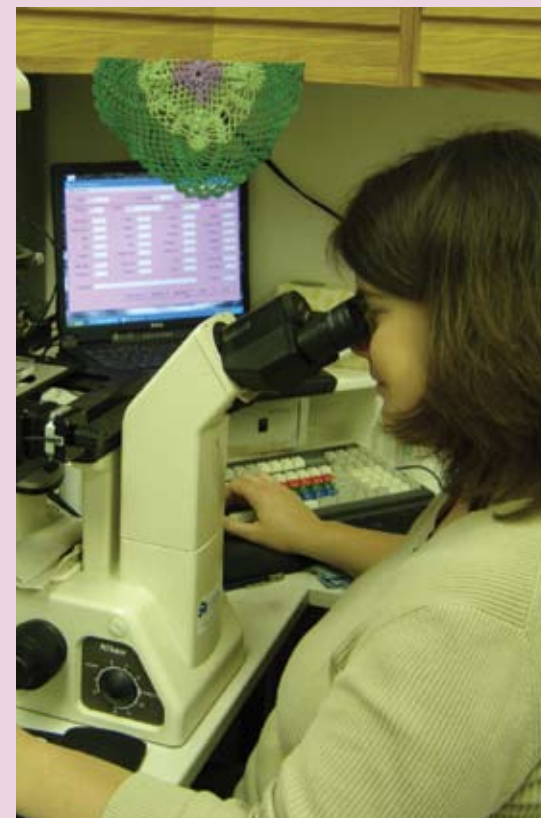
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www.ncagr.com/agronomi

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revised July 2008

Nematode Assay



*A Diagnostic & Advisory Service
at the Root of Crop Losses*

N.C. Department of Agriculture
and Consumer Services

Steve Troxler, Commissioner

What are Plant-parasitic Nematodes?

Plant-parasitic nematodes are tiny worms 1/100 to 1/12 of an inch long. Most species feed on or live in plant roots (Figure 1). Others damage leaves and above-ground plant parts (Figure 2). Nearly all types of plants are parasitized by one or more nematode species.

Because nematodes are so small, a test is necessary to confirm their presence. A nematode assay is a microscopic examination of soil and roots that identifies species, estimates population size and assesses the potential danger of any plant-parasitic species present. If samples are carefully collected, this test is the most reliable means of identifying current or potential nematode problems.

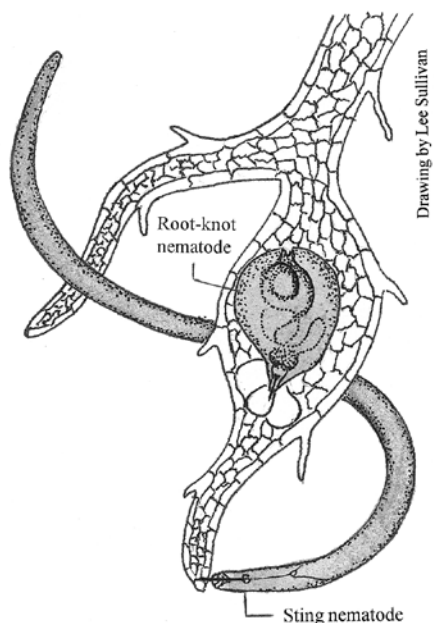


Figure 1. A root under assault by the two main classes of plant-parasitic nematode. Sting nematodes are migratory ectoparasites: they pierce roots from the outside. Root-knot nematodes are sedentary endoparasites: they embed their entire bodies within the root.

What Damage Do They Cause?

Nematodes interfere with nutrient uptake and can make plants more susceptible to disease-causing bacteria, fungi and viruses. Infected plants are often stunted or discolored, and yield can be drastically reduced (Figure 3). Only a few nematode species cause distinctive root damage.

Nematodes cause millions of dollars in crop losses each year. In many cases, the damage is blamed on some other problem, such as nutrient deficiency, drought or disease. This assessment is partially correct. Roots damaged by nematodes often become infected with other diseases. They



Figure 2. Some plant-parasitic nematodes infect and damage leaves instead of roots.



Figure 3. Spotty, stunted, and sometimes chlorotic, growth is typical of fields severely infested with nematodes.

cannot adequately absorb nutrients and water so plants do not grow as they should.

Benefits of Nematode Assay

The NCDA&CS Agronomic Division deals primarily with the diagnosis and management of crop nutrient problems. Identifying plant-parasitic nematodes falls within in this realm because these pests are often an underlying cause of nutrient deficiency. If growers do not realize that nematodes are contributing to a perceived nutrient problem, they may try to correct the situation by spending money on fertilizer that plants won't be able to use. This unused fertilizer is a potential pollutant of surface and ground water.

Drawing on more than 35 years of experience, the Agronomic Division's Nematode Assay Section assists plant growers in several ways. It

- predicts whether nematodes pose a threat to the next crop,
- diagnoses whether nematodes contribute to problems that are already apparent, and
- refers clients to appropriate management information.

Nematode assays are available for a fee of \$3 per sample for North Carolina residents. The laboratory processes problem samples in about five days. Routine samples take about three weeks. Ongoing research continually helps the lab refine its methods for determining the presence and impact of a wide range of plant-parasitic nematodes.

Checklist for Successful Results

- **Collect samples properly.** Sampling instructions are available online at www.ncda-cs.org.